



Theta Pro2Serve Management Company, LLC



Managed by
Theta Pro2Serve Management Company, LLC
for the Portsmouth/Paducah Project Office
of the United States Department of Energy

Environmental Management & Enrichment Facilities

De-lease and Deactivation Plan for the X-633 Facility at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio



This document is approved for public release per review
by:

Henry Thomas 09/29/2008

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**De-lease and Deactivation Plan
for the
X-633 Facility
at the
Portsmouth Gaseous Diffusion Plant
Piketon, Ohio**

Date Issued – September 2008

Prepared for the
U.S. Department of Energy
Portsmouth Paducah Project Office

Theta Pro2Serve Management Company LLC
Managing the
Infrastructure Activities at the
Portsmouth Gaseous Diffusion Plant
Under contract DE-AC24-05OH20193
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ACRONYMS

CFR	Code of Federal Regulation
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
HPFW	High Pressure Fire Water
M&I	Management and Integration
NRC	U.S. Nuclear Regulatory Commission
PA	Public Address
PAX	Private Automatic Exchange
PORTS	Portsmouth Gaseous Diffusion Plant
RCW	Recirculating Cooling Water
SCADA	Supervisory Control and Data Acquisition
S&M	Surveillance and Maintenance
TPMC	Theta Pro2Serve Management Company, LLC
USEC	United States Enrichment Corporation

EXECUTIVE SUMMARY

This planning document was prepared as a precursor to the de-lease of the X-633 RCW and cooling tower complex from the United States Enrichment Corporation (USEC). Its objective is to identify the desired status of facility interconnections with retained leased systems and to provide a plan for achieving this status. These objectives are developed for initial de-lease, transitional, and optimum long-term cold, tight, and dark status. Since the available engineering drawings may not accurately reflect actual field conditions, the locations of interface and isolation points are only approximate; however, they are sufficiently described to proceed with the de-lease process. Residual services that should at least initially continue to be provided by USEC are identified. Opportunities for further risk reduction through equipment removal are identified that further utilize the surveillance and maintenance (S&M) window of opportunity to lower decontamination and decommissioning (D&D) costs.

1. INTRODUCTION

In an effort to reduce the cost of maintaining facilities under the United States Enrichment Corporation (USEC) U.S. Nuclear Regulatory Commission (NRC) license, the U.S. Department of Energy (DOE) is taking steps to secure de-leasing of selected non-operating facilities from USEC. Surveillance and maintenance (S&M) responsibilities of the facilities will be transferred to the current remediation contractor, LATA/Parallax Portsmouth, LLC, or to the infrastructure contractor, Theta Pro2Serve Management Company, LLC (TPMC), until the management and integration (M&I) contractor for the decontamination and decommissioning (D&D) is able to take possession. The X-633 RCW pump house and cooling tower complex is being planned to be transferred to TPMC for this purpose on or about October 1, 2008.

A primary emphasis and end goal of this transition is risk reduction. The X-633 facility has a significant degree of interconnections with other systems and facilities. To protect the S&M worker from unsafe energies or environments, protect the environment from an inadvertent insult, allow the efficient performance of work, and to prevent impacting other facilities or systems that must remain in service or serviceable, a system by system review must be accomplished to determine desired status at either turnover or as soon as possible thereafter. For certain systems, the best status is complete isolation/air gapping. For others, removal of operating fluid (water) is sufficient. This report identifies the desired status of X-633 systems and relevant features when it is de-leased or as soon as possible thereafter and thus also defines tasks that must be accomplished by either USEC prior to de-lease or TPMC after de-lease. There are a few aspects of the X-633 that cannot reasonably be divested from USEC and they are identified here as well.

The ultimate state of the facility while it is awaiting D&D is deemed to be cold, tight, and dark. This condition is described as vacant except for periodic surveillances with most if not all utilities deactivated/drained to minimize potential ignition sources, mitigate unsafe conditions, and reduce consumption. Physical structure integrity is maintained to prevent deterioration that could make D&D problematic. Access is controlled to preclude unauthorized entry and personnel harm. This report also presents a plan for achieving this state.

Additionally since the X-633 is a non-radiological facility there are opportunities to generate revenue from sales of heavy industrial items that have value as whole goods or as salvage. This report identifies some strategies for pursuing this objective.

Finally, looking forward to the X-633 facility D&D, the final deactivation points, sequence, and methodology are presented along with geographical coordinates of isolation points. The approach taken for description is the isolation of the entire X-633 facility with all constituent entities being deactivated simultaneously.

NOTICE –DISCLAIMER

The information in this report represents a best effort attempt at systematically locating and identifying X-633 utility and other interfaces. It does not, however, replace the need for due diligence when performing work or constitute an assumption of liability for determining the presence of these and any other interfaces.

2. FACILITY DESCRIPTION

2.1 GENERAL

The X-633 Recirculating Cooling Water (RCW) complex (Fig. 1) is comprised of the X-633-1 pump house with a belowground sump and four X-633-2 cooling towers with basins. The pump house is a concrete and steel building that contains four 800 hp 13,000 gal/min and ten 1250 hp 20,000 gal/min pumps designed to supply cooling water mainly to the X-333 equipment. The cooling towers are designated X-633-2A, X-633-2B, X-633-2C, and X-633-2D and are designed to remove the heat of compression from the gaseous diffusion process. Minor heat loads from air conditioning, lube oil coolers, and other miscellaneous sources were also removed by the cooling towers. Water lost through evaporation was designed to be replenished from the X-611 Water Treatment Facility through a single 30 in. makeup water line. A redundant system of underground supply and return headers as large as 72 in. conveys the cooling water to and from the X-333 process system.



Fig. 1. Aerial view of the X-633 complex.

The cooling towers have in total 58 discrete cells or chambers that contain high efficiency honeycomb style fill. Hot water from the process is designed to flow downward through the fill where upward flowing air removes the heat. Air flow or draft is achieved through electric driven fans as large as 22 ft in diameter. Basins under each tower catch the cooled water where it drains by gravity back to the belowground sump (wet well) under the pump house. Six electrical feeds from the X-533 provide 13.8 kV power to step-down transformers which supply power to RCW pumps and cooling tower fans at 2400V and 480V respectively. A plan view showing facility numbers is shown in Fig. 2. A cross-section of a cooling tower is shown in Fig. 3. A diagram of water flow is shown in Fig. 4.

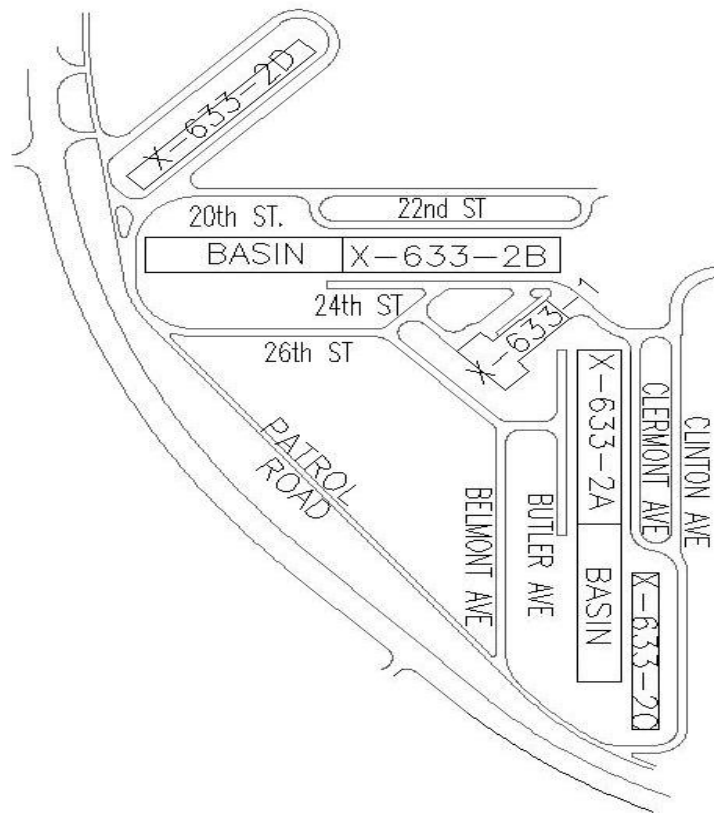


Fig. 2. X-633 complex plan view and numbers.

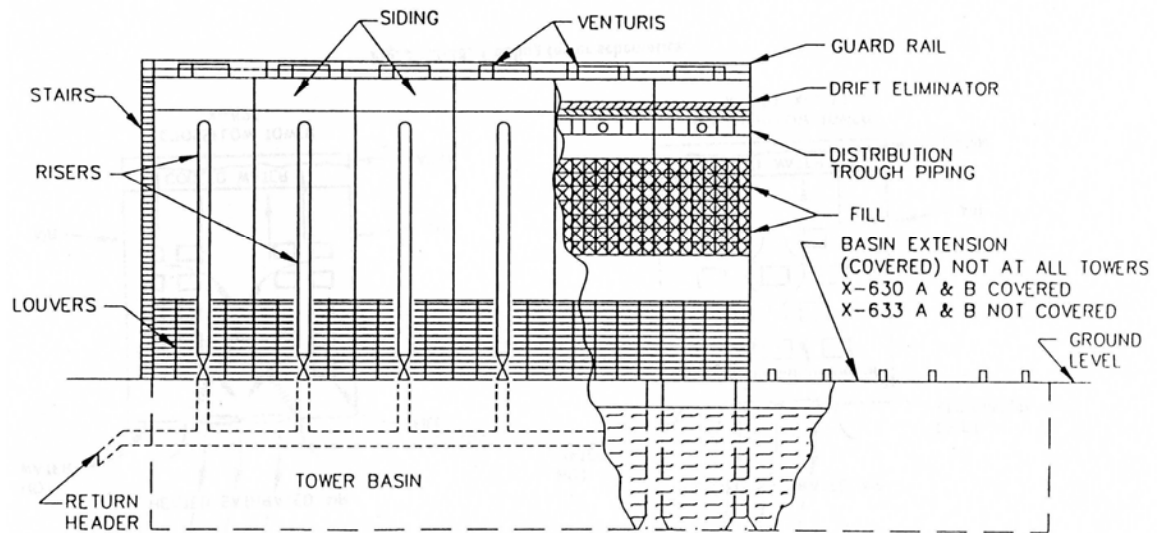


Fig. 3. Typical cooling tower cross section.

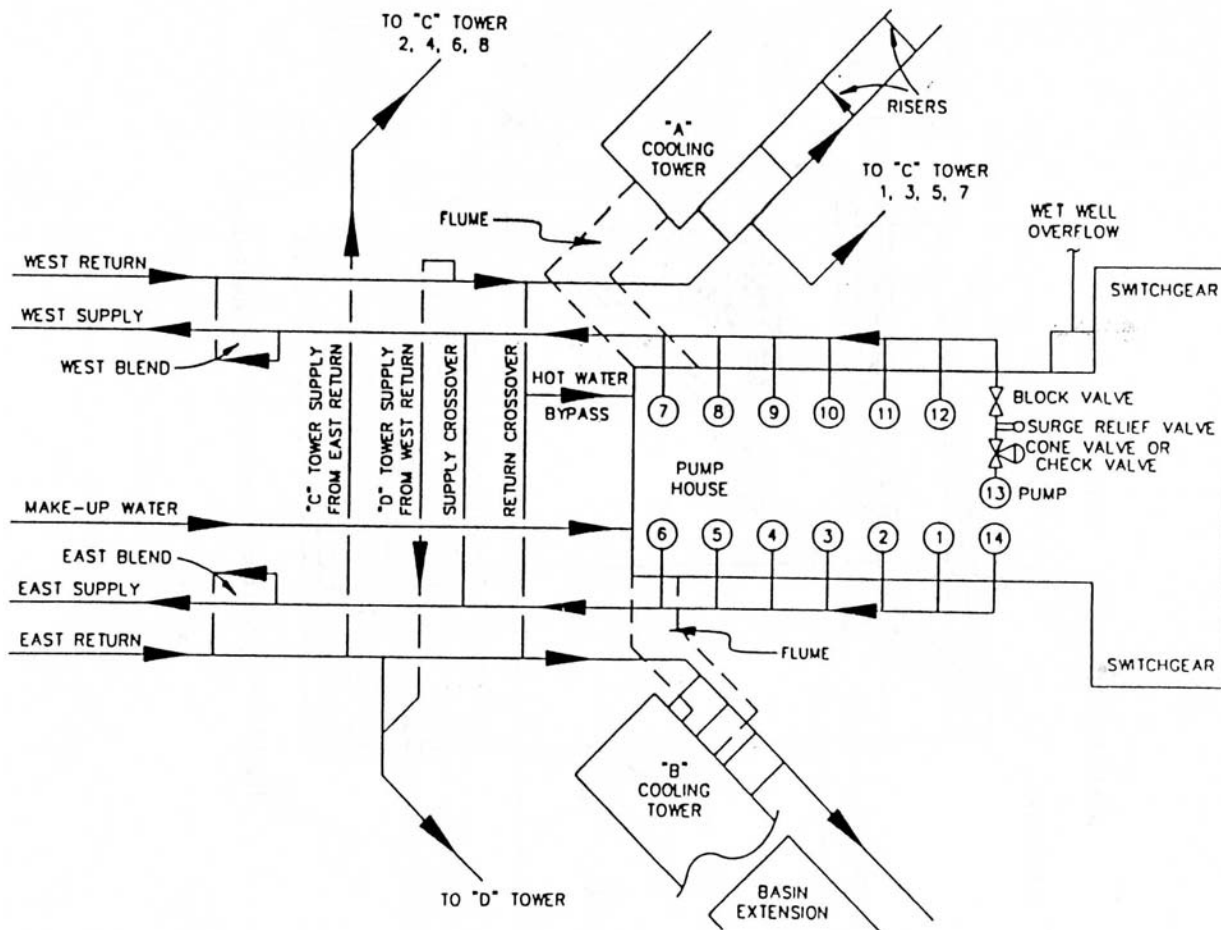


Fig. 4. RCW pump house flow diagram.

3. X-633 ISOLATION/DEACTIVATION PLAN FOR DE-LEASE

3.1 GENERAL

The X-633-1, X-633-2A, -2B, -2C, and -2D facilities are scheduled to be returned through de-lease from USEC to the DOE on October 1, 2008. This document presents the TPMC recommended state that these facilities be in at the time of transfer or as soon as possible thereafter. This status is based on what is needed to perform interim or transitional S&M in a safe and efficient manner and minimize environmental and other risks while preparing for eventual transition to the desired long-term S&M condition while awaiting D&D. A summary table that presents these recommended conditions is given as Table 1. Absent these conditions at turnover, effort should be undertaken by TPMC and others to achieve these conditions.

Table 1. Recommended status of utilities and other plant systems at X-633 turnover

Utility or plant system		Present condition	DOE status at turnover
Sanitary water		In-service	Disconnected and out-of-service to building
Sewage		N/A	N/A
Septic		In-service	Empty
Restroom		Out-of-service	Disconnected and out-of-service
Electrical	13.8 kV	In-service	De-energized and air gapped
	2400 Volts	In-service	
	480 Volts	In-service	Remain in-service
	120 Volts	In-service	
RCW		In-service	Disconnected and out-of-service - See below*
Recirculating Hot Water		N/A	N/A
Makeup water		Disconnected	Disconnected
RCW Chemical Systems		Out-of-service	Chemicals are to be removed
Acid (Storage tank has acid in it)		Tank valved off	Acid is to be removed. Provide documentation on the removal process and compliance with all applicable statutory and regulatory requirements.
Steam		Air Gapped	Air gapped
Condensate		N/A	N/A
High Pressure Fire Water (HPFW)		In-service	Remain in-service
Sanitary fire hydrants		In-service	
HPFW fire hydrants (at "D" tower)		In-service	
Fire alarms		In-service	
Evacuation alarms (Building evacuation only)		N/A	
CL ₂ alarms		Out-of-Service	
Criticality Accident Alarm System		N/A	N/A
Private automatic exchange (PAX) phone		N/A	
Red phone		In-service	Disconnected and out-of-service
Administrative plant phone		In-service	
Public address (PA) system		In-service	Remain in-service
Dry air (RCW equipment & HPFW dry pipe)		In-service	
Nitrogen		N/A	N/A
X-300 (Remote operation of pumps/alarms, etc.)		In-service	Disconnected and out-of-service
Switchgear supervisory		In-service	
DC Power (switchgear/alarms/lights, etc.)		In-service	Remain in-service
RCW blowdown (X-333 to River)		In-service	
Fire extinguishers		In-service	
HVAC systems		N/A	
Underground storage tanks (permitted)		N/A	N/A
Vent systems (Air Permits)		N/A	
Emergency generator(s)		N/A	
Fluorine		N/A	
PCB oil catch basins		N/A	
Facility temperature monitoring		N/A	
Emergency egress lighting		In-service	Remain in-service
Storm sewers		In-service	
Basins		Full	Drained – see below *
*Basins and sump are to be pumped dry in order to verify isolation and mitigate health and safety risks associated with leaving water in the basins.			

3.2 NEED FOR DEACTIVATION AND/OR ISOLATION

The following decision tree (Fig. 5) represents the process utilized to determine if a deactivation and/or isolation step is required. These isolations strive to also protect the S&M worker from unsafe energies or environments, protect the environment from an insult, allow the contractor to perform efficiently, and to prevent the impacting of other facilities or systems that must remain in service or serviceable.

Deactivation/Isolation Decision Tree

For Each Interface Point

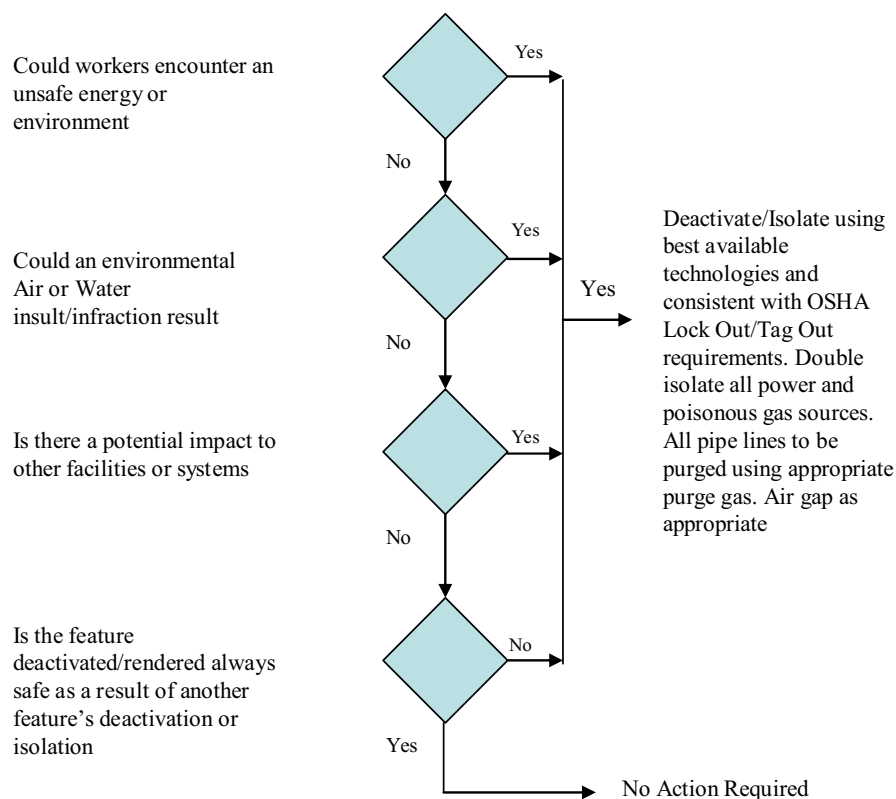


Fig. 5. Deactivation/isolation decision tree.

3.3 FACILITY INTERCONNECTIONS

The X-633 complex has now or has had the following connections to other site systems and utilities:

- Six 13.8kV underground power feeders from X-533

- Makeup water from X-611
- RCW supply and return headers
- Plant Dry Air
- Septic tank for sewage treatment
- Plant Steam
- Administrative Telephone
- PAX phone
- Ring-down (red phone)
- PA system
- Remote (X-300) pump operation system
- Black out lighting system
- Sanitary water
- High pressure fire water
- Supervisory Control and Data Acquisition System (SCADA),
- Plant PA system
- Superior American Fire Alarm system
- American District Telegraph fire system supervisory control system
- X-640-1 fire pump power supply
- X-640-1 transfer (jockey) pump power supply
- X-640-1 fire pump control system
- Perimeter road northeast quadrant security fence lighting
- Storm drains
- Plant Roads and culverts

Collectively, these interconnections represent what ultimately have been severed or will be severed when D&D occurs. A drawing showing these interconnections is shown in Appendix A of this report. A listing of the interface points with geographic coordinates of boundary interfaces and suggested isolation locations is given in Appendix B of this report.

3.4 ONGOING ISOLATION ACTIVITIES

USEC is conducting a project to allow the total shutdown of the X-533 switchyard. Since X-633 and consequently the critical fire water and fire water transfer pumps at X-640-1 are powered from X-633, a direct feed from X-530 to X-640-1 with a new substation is being installed that will shift the source of X-640-1 power from X-533 via X-633 to being directly from X-530. Similarly, the X-633 power source for the north east quadrant security fence lighting is being replaced by a connection to a X-530 sourced overhead feeder. Recognizing that there may be a need for a small amount of power at X-633 after the X-533 is shutdown, a small 480V 3 phase feed from X-640-1 is being retained that will feed lighting and sprinkler panel boards at X-633. All of the aforementioned activities will have been completed prior to X-633 de-lease.

3.5 END STATE S&M

The ultimate state of the facility while it is awaiting D&D is deemed to be cold, tight, and dark. This condition is described as vacant except for periodic surveillances with most if not all utilities deactivated/drained to minimize risk. Physical structure integrity is maintained to prevent deterioration

that could make D&D problematic. Access is controlled to preclude unauthorized entry and personnel harm.

The degree to which this facility state is pursued depends on the duration that it will remain in this state. For a short period of time or until a determination is made as to a facility's schedule for D&D, an interim transitional S&M status is preferred that retains risk reduction features inherent in the ongoing operation but minimizes operating costs. Typically partial deactivation or isolation is prescribed on some systems with others remaining in service. This interim status is the state recommended for the X-633 complex at the time of de-lease.

3.6 INTERIM STATUS/TURNOVER STATUS

The focus of the interim status is risk reduction. This means that sources of energy, unsafe features, hazardous materials, and life safety code issues have been identified or mitigated to the fullest extent possible. The following constitutes the desired status at turnover.

3.6.1 Basins/Sumps/Wet Wells

All basins (see Fig. 6), sumps, and wet wells should be emptied to the greatest extent possible. The current mode of operation of the X-633 provides an EPA permitted path to dispose of basin water to the Scioto River through the X-333 blowdown line using RCW supply line pressure. A portable pump will likely be needed to remove water remaining after the wet well basin level drops below the suction of the operating RCW pump. Primary fugitive sources of water that would tend to refill the basins such as the RCW makeup line and the X-330 to X-333 blowdown line should be valved off and preferably blanked or capped; integrity should be assured prior to de-lease. The RCW blowdown path to the Scioto River may need to remain operable as a hedge to permit future basin pump downs.

3.6.2 RCW Pumps

All RCW pumps should be shutdown. Once the 13.8kV feeds to the facility are air gapped, the 2400V needed to operate the pumps will not be available.

3.6.3 Electrical Supply

In order to remove the risk of inadvertent energizing of electrical equipment in X-633 or back-feeding to X-533, the 13.8kV feeders (354P1, 354P2, 363P3, 363P4, 3P513, 3P609) should be air-gapped by removing conductor links at the X-533 ground switch compartments and at the X-633 transformer disconnect cabinets and all three phases grounded. Minimal lighting, heating, and other needs at X-633 will be provided through the 480V back feed from X-640-1 installed with the X-533 bypass project.

3.6.4 Plant Dry Air

Plant dry air is utilized at X-633 to counter the water pressure in the dry pipe sprinkler valves utilized on X-633-2A, -2B, -2C, and -2D. It is also used for controls. At de-lease, the dry air system should remain in service until a standalone system can be provided if deemed cost effective.



Fig. 6. Cooling tower X-633-2B basin.

3.6.5 Steam Supply

Plant steam is currently disconnected to X-633 (air gapped). There is no need to utilize steam for S&M and therefore it should remain disconnected.

3.6.6 Acid Tank and Other Hazardous Material

Acid in the tank (Fig. 7) should be removed and documentation provided to certify it as empty. RCW treatment chemicals as well as tanks with potential residual quantities should also be removed prior to de-lease. Absent their removal for reuse, the S&M contractor will likely be forced to dispose of the materials and tanks as waste. A survey conducted during August 2006¹ indicated the presence of the following additional chemical hazards: asbestos-containing materials in transite siding and pipe insulation, potential PCBs in ten transformers and in fluorescent light fixtures, lead-based paint, chlorine cylinders (since removed), chromium in the wood and soils from historic chromated water treatment, and septic tank and leach bed. None of these items is expected to present any greater than a standard industrial hazard.

¹ TPMC/PORTS-59/R1, Facility Condition Survey of the Portsmouth Gaseous Diffusion Plant Facilities, Piketon, Ohio, August, 2006



Fig. 7. X-633 sulfuric acid tank.

3.6.7 Junk and Other Non-Hazardous Materials

There is a fairly minor amount of parts, tooling, and removed parts and pieces randomly lying about the facility. Items such as cooling tower fill, fiberglass fan venturis, and removed redwood are stacked up and generally not a problem. Future S&M activities may attempt to impart some order to these items. A survey² conducted in February 2006 indicated that there was as much as 13,000 ft³ of debris and spare parts lying throughout the facility but there are indications that some items have been removed from the area and the current volume reduced.

3.6.8 Title 10 Code of Federal Regulation (CFR) 851

10CFR851.21(a) requires the contractor to perform an initial baseline hazards identification assessment on a closure facility. Within 90 days after identifying hazards, a list of closure facility hazards identified in this assessment is to be supplied to the DOE Field Element [10CFR851.21(b)]. A thorough assessment must be accomplished, results reported, and steps taken to mitigate the hazards. Technical compliance must be achieved or else additional controls to protect the workers must be put in place. With the X-633, defective hand railings and other guarding and unsafe walking surfaces will likely be encountered and must be quickly repaired or else additional controls such as more robust barricades installed.

² TPMC/PORTS-52, Cost Estimate for Removing Excess Equipment and Materials from the Support Buildings and Grounds at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio, February 2006

3.6.9 Specialty Tooling

X-633 specific wrenches and spanners, lifting fixtures, breaker racking tools and carts, and maintenance coverings should be retained at the facility after de-lease. Portable non-X-633 specific equipment such as lift a-lofts, portable cranes, and personal tools should be removed.

3.6.10 High Pressure Fire and Sanitary Water Sprinkler Systems and Hydrants

All fire suppression systems and water supply hydrants should remain in service at the time at of de-lease.

3.6.11 Fire Alarms and Fire Supervisory Systems

All fire alarm boxes, data acquisition, and system supervisory equipment pertinent to the X-633 complex should remain in service. Fire system components located at X-633-1 and relevant to X-640-1 operation are being relocated or functionally replaced at X-640-1 and will no longer be needed at X-633.

3.6.12 Fire Extinguishers

All fire extinguishers are to remain in place at de-lease until and unless alternative approaches are evaluated.

3.6.13 Sanitary Water

There is one sanitary water tap or feed that enters the X-633-1. It enters under the southeast wall near the restroom facility. It feeds the restroom and the eye wash and sink in the battery room. There appears to be a tap before the isolation valve B1 that supplies the eye wash at the acid tank. Since the facility will be unmanned and the acid removed, the facility will not need sanitary water.

3.6.14 Sewage/Septic/Restroom

The X-633 has a septic tank for its sewage and is not connected to the plant central collection system. The tank is located in the rear of X-633-1 across Belmont Avenue. Eventually, the tank will need removed but since the facility is unmanned with the restroom removed from service, the septic tank can either remain or be removed without impact on S&M.

3.6.15 Administrative, PAX, and Ring Down (Red) Telephones

All telephone service to X-633 should be discontinued. Actual telephone circuits are to be disconnected at X-540 (by Chillicothe Telephone Company). The ring-down feature may be disconnected at X-300 process telephone cabinet #2.

3.6.16 Supervisory Control and Data Acquisition (SCADA)

X-633 transformer secondary breaker and substation tie breaker positions are monitored from X-300 with the Power Operations SCADA system. This function will not be needed since all of the transformers and switchgear will be shutdown and isolated. Lift leads in panel RP633 at X-633 for cable S1010 and open test switches at X-533 RTU-1.

3.6.17 X-300 Remote Pump Operation system

With the RCW pumps being shutdown, this feature will not be needed and should be disconnected in the X-633 remote pump control & pilot wire junction box on the west wall of the switchgear room.

3.6.18 Storm Drains

All storm drains and ditches should remain operable.

3.6.19 Plant PA system

The plant PA system for X-633 should remain in service and operable.

3.6.20 Emergency Lighting and Black-Out Lighting

At de-lease the emergency egress lighting system including the DC power system and batteries should remain in service. The black out lighting system is inoperable and should remain as such.

3.6.21 Chlorine Alarm

The chlorine alarm was needed when chlorine gas was used as the disinfectant for the RCW. There will be no need for chlorine during S&M so the alarm can remain out of service. It has been disabled and can remain as such.

3.6.22 Roads

The gravel and asphalt roads interconnecting the separate entities of the X-633 facility are to remain in service.

3.6.23 Security Lighting Power Supply

The power supply to the northeast quadrant security lighting circuits is to be removed from service prior to de-lease. The security lighting will remain and be powered from the X-530. The ongoing X-533 bypass project adequately addresses this change.

3.7 REMAINING SITE SERVICES

As a consequence of the remaining system interconnections, the following significant site services will need to be provided to the X-633 complex from USEC at and for some period after de-lease:

- Plant dry air
- Power from X-530 via X-640-1A
- Fire system services (alarms, hydrants, etc.)
- Fire and emergency response
- Fire extinguisher provision and periodic replacement
- Storm water runoff (outfall management)
- PA system
- RCW blowdown valve operability – if later pump down is needed (outfall management)
- Security patrols

Additionally, valves 28-1/BP, 28-2/BP, and 28-3/BP (Fig. 8) which serve as plantsite sanitary water main valves will be inside the de-leased perimeter. They must remain in service for all site tenants with access assured for emergency purposes. Jurisdiction over these valves should remain with USEC.



Fig. 8. Sanitary and makeup water main shutoff valves.

4. EQUIPMENT REMOVAL

4.1 REMOVAL OF EQUIPMENT FOR SALE AS A MEANS OF RISK REDUCTION

We propose selected removal of items that either present a site risk if left as is or have a high monetary attractiveness level that is at risk of being lost if left in place. The following items are felt to be likely candidates for early removal and sale through the DOE property disposition process. After de-lease of X-633, the removal of items for reuse at Paducah will of course negate this disposition pathway but still accomplishes risk reduction.

4.2 FAN MOTORS AND GEARBOXES

Each fan (58) has an associated gear box, drive shaft, and electric motor. Many of the fans also have an electric brake. These items are together mounted on a ladder I-beam frame to distribute their weight and provide structural rigidity for the drive train. Each gear box has about 5 gal of gear oil in it that could leak potentially creating an environmental insult. The fan drive assemblies are relatively heavy and present a structural load on the aging and deteriorating tower frame. While the towers are still safe for personnel access, the fan drive assemblies should be removed. Once removed, they likely could be marketed. If a tower is allowed to deteriorate to where it is unsafe for personnel access, the fan drives assemblies would then have to come down with the tower and in so doing spread the oil throughout the debris and likely damaging the units thereby destroying their value.

4.3 ELECTRICAL SWITCHGEAR

While much of the oil filled transformer and switchgear capacity is original vintage and obsolete, transformers 9 and 10 (Fig. 9) along with the motor starters (Fig. 10) for cooling towers C and D are modern technology.



Fig. 9. Cooling tower C and D switchgear.



Fig. 10. Cooling tower C and D 480V switchgear.

4.4 RCW PUMPS

The pumps and drives (Fig. 11) are themselves a commonly used item in many applications worldwide. They are useful for such things as flood control, desalination, irrigation, and generally any water handling application. It is envisioned that they will be a readily marketable commodity. They also

have oil systems for lubrication. The cone valves, surge relief valves, and aboveground block valves that accompany each pump will likely also enjoy similar marketability. The period of time that the facility is in S&M presents a window of opportunity to explore revenue generating disposition pathways that might be lost during the D&D program.



Fig. 11. X-633 RCW pumps.

5. COLD, TIGHT, AND DARK

5.1 TRANSITION TO AN OPTIMUM S&M PROGRAM

After de-lease, TPMC should advance the facility state to cold, tight, and dark as well as attempt further isolation from USEC services. This condition is described as vacant except for periodic and infrequent surveillances with all utilities deactivated/drained to minimize potential ignition sources, mitigate unsafe conditions, and reduce consumption. Physical structure integrity should be maintained to prevent deterioration that could make D&D problematic. Access is robustly controlled to preclude unauthorized entry and personnel harm.

The key to achieving this state is to sufficiently reduce risk by systematically removing all hazards and drivers for introducing new hazards. For the X-633 existing hazards include: oils and chemicals, confined spaces and elevated walk ways, combustibles, and energized electrical equipment. Oils and chemicals are removed by draining tanks and reservoirs. Physical removal or air gapping of some items may be necessary to assure this is sufficiently thorough.

The main basins are problematic in that rain water may reintroduce the need for pumping. Once the basins have been initially pumped empty, rain water entry into C and D towers should be minimized by plugging the scuppers where the drift eliminator catch basins drain into the main tower basins. To prevent water ponding on these surfaces, slots may need to be cut into the concrete to direct rain water to the storm drainage system. Rain water entering through other means will generally flow by gravity to the main sump under the RCW pump house. If this becomes a significant problem with accumulating water

creating a stagnancy and insect breeding issue in the sump that cannot be mitigated by periodic portable pumping, a fixed sump pump may need to be installed with float switch activation. With no added runoff entering the basins, the amount of water needing pumped each year should be no greater than the average rainfall or about 40 in.

Removal of combustibles can be relatively easily accomplished in the RCW pump house itself (figure 11) due to the concrete and steel construction. Oils can easily be drained. Oil residues and saturated equipment items (motors) should be removed as discussed in the section on equipment removal.

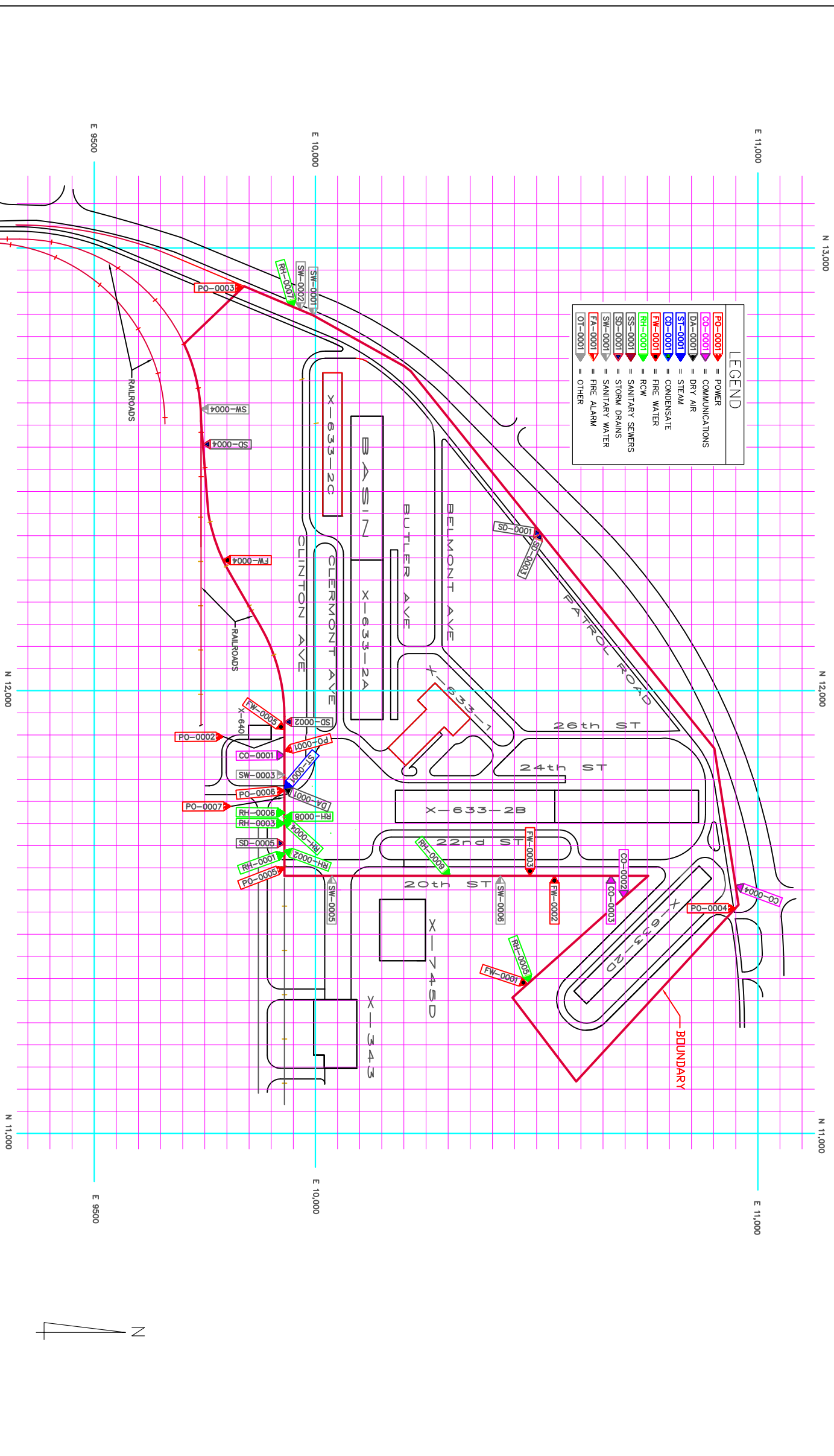


Fig. 11. A view of the X-633-1 RCW pump house.

Tightening the facility is primarily a matter of repairing or replacing broken glass, pedestrian doors, or transite openings that are allowing vermin and weather to enter the building. Since there are only a few doors, chaining, welding shut, and multiple locking of entrances can almost unequivocally assure unauthorized access is prevented for all but the highest motivated trespasser.

APPENDIX A

X-633 INTERFACE LOCATION DRAWING

[illegible]

APPENDIX B

X-633 ABOVE AND BELOWGROUND INTERFACES

Table B.1. X-633 Belowground Interfaces

Interface tag Number	Plant Site Grid North (ft)	Plant Site Grid East (ft)	Elevation (ft) Grade @ 685'	Feature size/material	Reference drawing	Other considerations	Isolation needed (yes/no)	Method of isolation	De-energization identification or location
Power									
X-00633-PO-B-0001	11864.5	9934.14	675.17' Inv	21"X30" concrete duct with 6 ea. 5" conduits containing the 2400V feeds to X-633-1 transformers	X-215-A-2028E X-215-A-2005E X-204A E-5 X-633-1-C	Reference point of interface is where power duct bank crosses the established boundary definition	Yes	Abandon	Abandon duct bank Isolate contents of duck bank as follows: Cable 3P1 air gap at X-533 ACB 354P1 & air gap at X-633 Transformers 5 & 7; Cable 3P2 air gap at X-533 ACB 354P2 & air gap at X-633 Transformers 6 & 8; Cable 3P3 air gap at X-533 ACB 363P3 & air gap at X-633 Transformers 1 & 3; Cable 3P4 air gap at X-533 ACB 363P4 & air gap at X-633 Transformers 2 & 4 Cable 3P5 air gap at X-533 ACB 3P513 & air gap at X-633 Transformer #10 Cable 3P6 air gap at X-533 ACB 3P609 & air gap at X-633 Transformer # 9
Sanitary Water									
X-00633-SW-B-0001	12883.60	9932.75	TBD	18" Sanitary line for fire hydrants	X-204A-104-E	Reference point of interface is where water line crosses established boundary definition	No	None	Sanitary fire water system to remain in service

Table B.1. X-633 Belowground Interfaces (continued)

Interface tag Number	Plant Site Grid North (ft)	Plant Site Grid East (ft)	Elevation (ft) 1 st Floor @ 672'	Feature size/material	Reference drawing	Other considerations	Isolation needed (yes/no)	Method of isolation	De-energization identification or location
Sanitary Water (Cont.)									
X-00633-SW-B-0002	12896.59	9906.51	TBD	18" Sanitary line for fire hydrants	X-204A-104-E	Reference point of interface is where water line crosses established boundary definition	No	None	Sanitary fire water system to remain in service
X-00633-SW-B-0003	11809.93	9930.01	TBD	18" Sanitary line for fire hydrants	X-633-7075-E	Reference point of interface is where water line crosses established boundary definition	No	None	Sanitary fire water system to remain in service
X-00633-SW-B-0004	12635.81	9742.46	TBD	12" sanitary fire water line	X-633-1-C	Reference point of interface is where water line crosses established boundary definition	No	None	Sanitary fire water system to remain in service
X-00633-SW-B-0005	11581.77	10037.76	TBD	12" sanitary fire water line for fire hydrant 20-H-7E	X-633-1-C	Reference point of interface is where water line crosses established boundary definition	No	None	Sanitary fire water system to remain in service

Table B.1. X-633 Belowground Interfaces (continued)

Interface tag Number	Plant Site Grid North (ft)	Plant Site Grid East (ft)	Elevation (ft) 1 st Floor @ 672'	Feature size/material	Reference drawing	Other considerations	Isolation needed (yes/no)	Method of isolation	De-energization identification or location
Sanitary Water (Cont.)									
X-00633-SW-B-0006	11581.77	10418.26	TBD	12" sanitary fire water line for fire hydrant 20-H-8E	X-633-1-C	Reference point of interface is where water line crosses established boundary definition	No	None	Sanitary fire water system to remain in service
Communications									
X-00633-CO-B-0001	11851.72	9930.01	~674.75' Inv	14½" X 25" concrete duct with 8 ea. 3" conduits containing SCADA, PA, Phone (PAX & PBX), fire alarm loops and remote pump control	X-215-A-2028E X-215-A-2005E X-215-A-2028E X-215-A-2005E X-220H-103E X-220 41-E X-220H-105E X-220H-101E X-220S-5019E X-220S-5009E	Reference point of interface is where duct bank crosses established boundary definition	No	Abandon duct bank, isolation of individual circuits follows	Abandon duck bank. Fire Alarm Box Loop X-533 at Col. G-35 disconnect cables FA81 and FA82 in junction box going to X-633-1 and short together cables FA81 & FA82 in junction box for X-533 to close the fire alarm loop, at X-633-1 in PAX Terminal Cabinet disconnect and air gap wires FA81 & FA82.

Table B.1. X-633 Belowground Interfaces (continued)

Interface tag Number	Plant Site Grid North (ft)	Plant Site Grid East (ft)	Elevation (ft) 1 st Floor @ 672'	Feature size/material	Reference drawing	Other considerations	Isolation needed (yes/no)	Method of isolation	De-energization identification or location
Communications (Cont.)									<p><u>Supervisory Loop</u> X-533 at SAS Terminal Cabinet disconnect wires 1S3 & 1S4 going to X-633-1 and install jumper on terminal strip at terminals 1S3 & 1S4, at X-633-1 SAS Terminal Cabinet remove wires 1S3 & 1S4 from terminal strip and air gap.</p> <p><u>Alarm Loop</u> X-533 at PAX & SAS terminal cabinet disconnect wires A5, A9, SH and GR going to X-633-1 and install jumper on terminal strip between terminals A5 & A9 closing loop, at X-633-1 PAX 633-1 Terminal Cabinet disconnect and air gap wires A5, A9, SH and GR coming from X-533</p> <p><u>SCADA Cable S-1010</u> X-633 relay panel RP633 air gap cable S-1010 and at X-533 air gap cable S1010 at RTU-1</p> <p><u>PA System</u> X-633 PA System to remain operative until building is scheduled for D&D, at that point isolation is at X-633 air gap PA+ & PA- and PL+ & PL- at</p> <p><u>Admin. Telephone</u> <u>PBX 633</u> <u>PAX 633</u> <u>Remote Pump Controls</u></p>

Table B.1. X-633 Belowground Interfaces (continued)

Interface tag Number	Plant Site Grid North (ft)	Plant Site Grid East (ft)	Elevation (ft) 1 st Floor @ 672'	Feature size/material	Reference drawing	Other considerations	Isolation needed (yes/no)	Method of isolation	De-energization identification or location
Communications (Cont.)									
X-00633-CO-B-0002	11531.97	10696.72	~675.0' Inv.	23" X 41" Concrete Duct bank with 18 each 3" fiber conduits	X-633-7075-E	Reference is where duck crosses established boundary definition	No	Abandon duct bank, isolation of individual circuits follows	<u>FA Loop</u> <u>480V Power Valve Vaults</u> <u>PAX</u> <u>Fan Control</u> <u>Fan 480V Power</u>
X-00633-CO-B-0003	11581.77	10668.11	~675.0' Inv.	23" X 41" Concrete Duct bank with 18 each 3" fiber conduits	X-633-7075-E	Reference is where duck crosses established boundary definition	No	Abandon duct bank, isolation of individual circuits identified in Interface tag number X-00633-CO-B-0002	Same as X-00633-CO-B-0002
Storm Drains									
X-00633-SD-B-0001	12354.92	10509.60	650.0' Inv	48" Storm Drain	X-240A-104-E	Grid is referenced to drain entrance to boundary definition area	No	None	None
X-00633-SD-B-0002	11929.59	9930.01	666.28' Inv	10" Storm Drain	X-633-1-C	Grid is referenced to drain entrance to boundary definition area	No	None	None

Table B.1. X-633 Belowground Interfaces (continued)

Interface tag Number	Plant Site Grid North (ft)	Plant Site Grid East (ft)	Elevation (ft) 1 st Floor @ 672'	Feature size/material	Reference drawing	Other considerations	Isolation needed (yes/no)	Method of isolation	De-energization identification or location
Storm Drains (Cont.)									
X-00633-SD-B-0003	12355.81	10510.06	665.86' Inv	66" Storm Drain	X-633-1-C	Grid is referenced to drain entrance to boundary definition area	No	None	None
X-00633-SD-B-0004	12556.61	9743.95	654.75' Inv	48" Storm Drain	X-633-1-C	Grid is referenced to drain entrance to boundary definition area	No	None	None
X-00633-SD-B-0005	11665.18	9930.01	665.18 Inv	12" Storm Drain	X-633-1-C	Grid is referenced to drain entrance to boundary definition area	No	None	None
Heating Water									
X-00633-RH-B-0001	11634.27	9930.01	TBD	72" RCW East Return	X-633-7074-E X-633-1-C	Reference is where RCW water line crosses established boundary definition	Yes	Shut off/blind flange pipe	Close Blocking valve, blind flange on east side of valve at valve vault "A"
X-00633-RH-B-0002	11693.24	9930.01	TBD	60" RCW East Supply	X-633-7074-E X-633-1-C	Reference is where RCW water line crosses established boundary definition	Yes	Shut off/blind flange pipe	Close Blocking valve, blind flange on east side of valve at valve vault "A"

Table B.1. X-633 Belowground Interfaces (continued)

Interface tag Number	Plant Site Grid North (ft)	Plant Site Grid East (ft)	Elevation (ft) 1 st Floor @ 672'	Feature size/material	Reference drawing	Other considerations	Isolation needed (yes/no)	Method of isolation	De-energization identification or location
Heating Water (Cont.)									
X-00633-RH-B-0003	11699.99	9930.01	TBD	72" RCW West Return	X-633-7074-E X-633-1-C	Reference is where RCW water line crosses established boundary definition	Yes	Shut off/blind flange pipe	Close Blocking valve, blind flange on east side of valve at valve vault "B"
X-00633-RH-B-0004	11709.53	9930.01	TBD	72" RCW West Supply	X-633-7074-E X-633-1-C	Reference is where RCW water line crosses established boundary definition	Yes	Shut off/blind flange pipe	Close Blocking valve, blind flange on east side of valve at valve vault "B"
X-00633-RH-B-0005	11341.56	10484.39	TBD	66" RCW Return line for 2D Cooling Tower	X-633-7075-E X-633-1-C	Reference is where RCW water line crosses established boundary definition (second crossing of boundary)	No	None	None
X-00633-RH-B-0006	11724.44	9930.01	TBD	30" Makeup Water pipe	X-633-7074-E X-633-1-C	Reference is where Makeup water line crosses established boundary definition	Yes	Shut off/blind flange pipe	Close Blocking valve, blind flange on east side of valve at valve vault "E"

Table B.1. X-633 Belowground Interfaces (continued)

Interface tag Number	Plant Site Grid North (ft)	Plant Site Grid East (ft)	Elevation (ft) 1 st Floor @ 672'	Feature size/material	Reference drawing	Other considerations	Isolation needed (yes/no)	Method of isolation	De-energization identification or location
Heating Water (Cont.)									
X-00633-RH-B-0007	12874.88	9950.42	TBD	36" Makeup Water line from X-611	X-633-1-C	Reference is where Makeup water line crosses established boundary definition	Yes	Shut off/blind flange pipe	Close isolation valve at X-611
X-00633-RH-B-0008	11715.21	9930.01	TBD	30" Emergency Supply	X-633-1-C	Reference is where Blend line crosses established boundary definition	Yes	Shut off/blind flange pipe	
X-00633-RH-B-0009	11581.77	10302.06	TBD	66" RCW Return line for 2D Cooling Tower	X-633-7075-E X-633-1-C	Reference is where RCW water line crosses established boundary definition	Yes	Shut off/blind flange pipe	

Table B.1. X-633 Belowground Interfaces (continued)

Interface tag Number	Plant Site Grid North (ft)	Plant Site Grid East (ft)	Elevation (ft) 1 st Floor @ 672'	Feature size/material	Reference drawing	Other considerations	Isolation needed (yes/no)	Method of isolation	De-energization identification or location
Fire Water									
X-00633-FW-B-0001	11336.87	10479.13	TBD	14" High pressure fire water line	X-633-7075-E X-633-1-C	Reference is where HP fire water line crosses established boundary definition	No	None	High pressure fire water system to remain in service until cooling towers are scheduled for D&D, to isolate cooling tower 2A close Section PIV's 636B, 714 & 714D, isolate 2B close Sectional PIV's 678F, 678G & 636B; to isolate tower 2C close Sectional PIV's 714 & 714C; to isolate tower 2D close Sectional PIV's 678 & 678F
X-00633-FW-B-0002	11581.77	10540.39	TBD	14" High pressure fire water line	X-633-7075-E	Reference is where HP fire water line crosses established boundary definition	No	None	High pressure fire water system to remain in service until cooling towers are scheduled for D&D, to isolate cooling tower 2A close Section PIV's 636B, 714 & 714D, isolate 2B close Sectional PIV's 678F, 678G & 636B; to isolate tower 2C close Sectional PIV's 714 & 714C; to isolate tower 2D close Sectional PIV's 678 & 678F
X-00633-FW-B-0003	11581.77	10485.09	TBD	14" High pressure fire water line	X-633-1-C	Reference is where HP fire water line crosses established boundary definition	No	None	None

Table B.1. X-633 Belowground Interfaces (continued)

Interface tag Number	Plant Site Grid North (ft)	Plant Site Grid East (ft)	Elevation (ft) 1 st Floor @ 672'	Feature size/material	Reference drawing	Other considerations	Isolation needed (yes/no)	Method of isolation	De-energization identification or location
Fire Water (Cont.)									
X-00633-FW-B-0004	12295.88	9794.07	TBD	14" High pressure fire water line	X-633-1-C	Reference is where HP fire water line crosses established boundary definition	No	None	None
X-00633-FW-B-0005	11912.0	9930.01	TBD	24" Sanitary fire water line	X-633-1-C X-240-A E5	Reference point of interface is where water line crosses established boundary definition	No	None	Sanitary fire water system to remain in service

Table B.2. X-633 Aboveground Interfaces

Interface tag Number	Plant Site Grid North (ft)	Plant Site Grid East (ft)	Elevation (ft) 1 st Floor @ 672'	Feature size/material	Reference drawing	Other considerations	Isolation needed (yes/no)	Method of isolation	De-energization identification or location
Communications									
X-00633-CO-A-0004	11560.21	10949.64	TBD	4 conductor telephone cable	Visual	Cable is currently abandoned	No	None	Remove abandoned telephone cable from cooling tower and security fence light poles
Steam									
X-00633-ST-A-0001	11776.98	9930.01	TBD	Abandoned steam line	X-633-1-C	Steam line is currently abandoned	No	None	None
Air									
X-00633-DA-A-0001	11776.98	9930.01	TBD	Air line to X-633	X-633-1-C	To remain in service	No	None	None